REMARKS

Status of the Claims

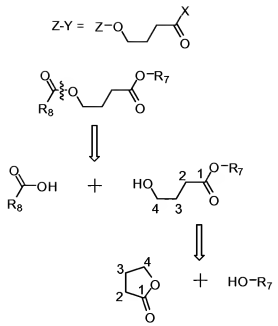
Claims 2, 4 – 6, 10 – 12, 16 – 17, and 21- 23 are currently pending. Claims 3, 7 – 9, 13 – 15, and 18 – 20 have been withdrawn. Claims 2, 4, 10, and 11 are presently amended to correct the term "-OP(O)(**O**R_{19})(OR_{20})"; support for the amendment can be found in the application as filed, for example, page 11, lines 15 – 25.

Rejection of Claims under 35 U.S.C. §103

Claims 2, 4 – 6, 10 – 12, 16 – 17, and 21- 23 stand rejected under 35 U.S.C. §103(a) as allegedly being obvious over the disclosure of Anderson (US Pat. No. 6,437,150) in view of Rock (US 6,022,529). In the present final office action, the Office has alleged that (emphasis added) "Anderson discloses the use of molecules that undergo *photochemical transformation* to emit a smell," but admits that "while Anderson discloses many different structures appropriate for photochemical rearrangement, Anderson does not disclose the specific structure of Applicant's species." The Office then states that Rock is relied upon for "disclos[ing] a structure identical to applicant's sans the fragrance molecule." Therefore, according to the Office, the present claims are obvious over the combination of Anderson and Rock because "it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the composition of Rock with the invention of Anderson. The purpose of Anderson's invention is nearly identical to that of applicant's and the specific structures are known in the art. The R^1 group of Rock could be substituted rather easily with the molecule disclosed in Anderson to achieve the same purpose as Anderson. The claim would have been obvious because the substitution of one known element for another would have yielded predictable results to one of ordinary skill in the art at the time of the invention." Applicants respectfully traverse.

Scope of the Prior Art

Anderson generally discusses the use of "activating conditions" to generate organoleptics from precursor chemical compounds (Abstract). The organoleptic compounds can be fragrances (Abstract). Activating conditions include light (Column 4, lines 7 – 17). In particular, Anderson teaches molecules defined by the formula "Z-Y" that breakdown under "activating conditions" as follow (Scheme at the top of columns 5 and 6; R and n groups removed for clarity):



In Anderson, the "Z" group is indicated as a "protecting group" (Column 4, lines 34-35). "Cleavage" of the Z-Y ester bond produces R_8-COOH and an ω-hydroxyalkylester (Y-H). Post-cleavage, the hydroxyester (Y-H) can intramolecularly cyclize to a lactone and R_7-OH (X-H). In the scheme at the top of columns 5 and 6, R_8COOH can decarboxylate to yield a ketone (*i.e.*, when $R_8 = RC(O)CH_2$-). Thus, the products of decomposition are one of (a) a ketone, alcohol, and lactone; and (b) a carboxylic acid (if R_8COOH does not decarboxylate), alcohol, and lactone.

Anderson only generically alludes to the possibility that the compounds of formula Z-Y can have a "photolabile" ester (Column 7, lines 1 – 6) and that light is an "activating condition". Only Example 50 of Anderson provides a compound which contains a moiety which may be considered a photoactive group. The compound disclosed in Example 50, (E)-3-(2-hydroxyphenyl)acrylic acid 1-(2-hex-3Z-enyloxycarbonylethyl)hexyl ether, contains a *o*-hydroxy-(E)-cinnamate group. Upon exposure to light, the cinnamate portion of the molecule can isomerize to the (Z) form. This isomerization enables the hydroxy portion of the cinnamate to be in position to release an organoleptic via a lactonization reaction, generating coumarin. The released alcohol then can undergo an intramolecular trans-esterification (*i.e.,* lactonization), as discussed above, to yield an alkyl lactone and an unsaturated alcohol. While the release of the coumarin from the compound of Example 50 is initiated by light, the ultimate release is a lactonization.

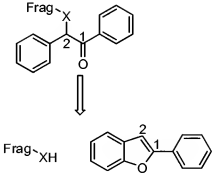
In each instance where a molecule is released during the decomposition of the "Z-Y" molecules in Anderson, the reaction is essentially a *hydrolysis or trans-esterification* (*e.g.*, intramolecular lactonization). Further, the scheme and the Examples section (Examples 51- 54) only teach direct or enzymatic hydrolysis of the initial Z-Y compound to initiate cyclization to form a lactone and thereby release of an organoleptic group (Compound 4) as discussed in detail above.

Rock merely discloses sunscreen compositions containing a molecule which, upon exposure to sunlight, rearranges into a compound which has both stronger absorption and absorbs at a longer wavelength. The molecules are generally 2-acyloxybenzoin compounds which rearrange into 2-phenylbenzofurans with the concurrent release of acetic acid. Rock does not contain any disclosure related to photogenerated fragrance compounds or compositions.

Differences between the Claims and the Prior Art

As noted above, the compounds in Anderson are not cleaved as a direct result of exposure (or absorption) of light, they are only activated for lactonization, whereas the presently claimed compounds fragment as a direct result of exposure to light.

The present claims are directed to fragrance compositions comprising compounds which fragment as a direct consequence of exposure to light to release a fragrance (Frag), where X = -OC(O)-, -S-, -N(H), or $-P(O)(OR^{19})O-$:



The photofragmentation reaction releases the entirety of the "X-Frag" moiety from the benzoin parent molecule as the result of a homolytic cleavage of the carbon 2-X bond alpha to the carbonyl as a direct result of exposure of light; rearrangement of the fragmented molecule yields the 2-phenylbenzofuran. Note that at the site of fragmentation (carbon 2-X), only the hydrogen atom remains.

The presently claimed compositions clearly have a different mechanism of action than that taught by Anderson. The Anderson compounds merely release organoleptics via chemical degradation, as noted previously, while the presently claimed compounds release a fragrance via photofragmentation. Only in Example 50 does Anderson provide a molecule with a photoactive moiety; however, the molecule merely isomerizes upon exposure to light. The release of an organoleptic remains the result of an intramolecular lactonization, not a photofragmentation as in the presently claimed compositions.

In view of the lack of disclosure of any photofragmentable compounds in Anderson, there cannot be a simple substitution of one known element (in Anderson) for another (from Rock). Anderson does not provide any example or suggestion to use a photofragmentable group. A simple substitution would require the substitutable groups to have the same mechanisms of action, which are not present in the cited documents. As discussed above, there cannot be a simple substitution of a photofragmentable element for a hydrolysis element.

Further, the substitution of the photofragmentable element taught by Rock for the protecting group in Anderson would render Anderson unsatisfactory for its intended purpose. As stated in Column 7, lines 32 – 33 of Anderson, "Further, the compounds of the invention provide slow release of the active ingredients." As noted in Rock, the benzoins disclosed therein rapidly fragment and cyclize with a quantum efficiency of 0.64 (Column 3, lines 4 – 20). As shown in Figures 2 and 3, substantial portions of the benzoins taught by Rock are cyclized within 150 sec. of exposure to light. Rock even notes that the compounds therein are particularly sensitive to light stating at Column 5, lines 58 – 64, "sunscreen agents of the invention, such as benzoin derivatives of Formula 3, should be stored in a dark container to prevent premature rearrangement. Most preferably, sunscreen compositions containing benzoin derivatives should be stored in a dark, preferably black, container that significantly limits exposure of the composition to light." Therefore, one skilled in the art would not be motivated to modify Anderson to include the benzoin groups of Rock with a reasonable expectation of success in yielding a slow-releasing photoactivated fragrance composition, which is the stated goal of Anderson as noted above.

In light of the preceding deficiencies, the Office has not provided a proper *prima facie* case of obviousness of the present claims over Anderson in light of Rock, Applicants respectfully request reconsideration and withdrawal of the rejection.

Conclusion

Applicants respectfully submit that all requirements of patentability have been met. Allowance of the claims and passage of the case to issue are therefore respectfully solicited.

If the Examiner has any questions or comments regarding this Amendment, they are encouraged to contact the undersigned as indicated below.

Respectfully submitted,
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